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NAVFAC
Naval Facilities Engineering Command

DRAFT FINAL
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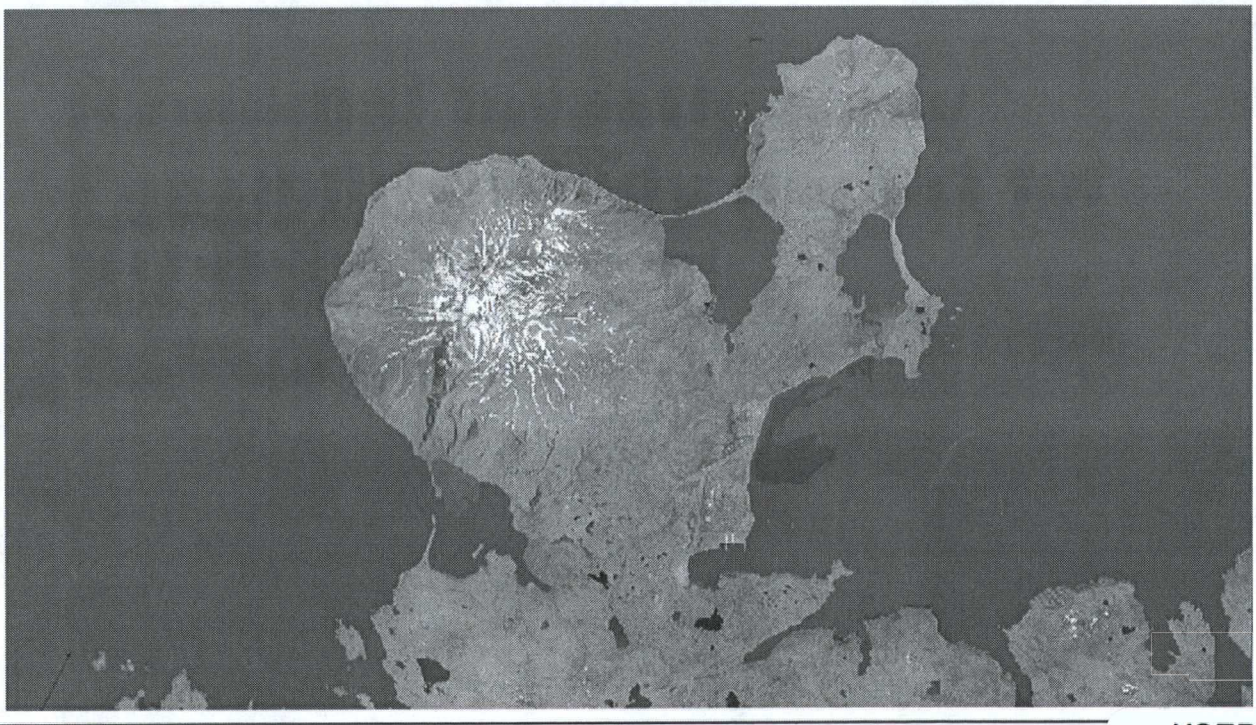
Remedial Investigation/ Feasibility Study Report for OU B-2 Sites

Former Naval Air Facility
Adak, Alaska

Department of the Navy
Naval Facilities Engineering Command
Engineering Field Activity, Northwest
19917 Seventh Avenue NE
Poulsbo, WA 98370-7570



EXECUTIVE SUMMARY

Adak is divided into two Operable Units (OUs): OU A and OU B. OU A was created first to address chemical contaminant issues. In June 1999, the Federal Facilities Agreement (FFA) was amended to create OU B to address ordnance contamination issues. OU B was, in turn, divided into OU B-1 and OU B-2 to facilitate completion of an investigation/ remedial action and transfer of sites subject to the September 2000 land transfer agreement.

OU B-1 includes 164 identified areas of concern (AOCs) within the military reservation lying outside of the Andrew Lake (Parcel 4) area (Figure 1-1). The OU B-1 Record of Decision (ROD), signed in December 2001, details the remedial alternatives considered for 27 sites and documents the selected alternatives. Clearance to 4 feet below ground surface was chosen in the ROD for the three OU B-1 remedial action sites. An observational approach combining investigation and clearance to 4 feet below ground surface was chosen as the presumptive remedy for the other 24 OU B-1 sites.

Final remedial actions were completed in OU B-1 during the 2002 field season. The land exchange conveying approximately 47,000 acres of the former Naval Air Facility (NAF) Adak property to The Aleut Corporation (TAC) was finalized in March 2004. In addition to the real estate transferred to TAC, approximately 24,000 acres of real estate (Parcels 2 and 3) of the military reservation on the northern portion of the island were transferred to the Department of Interior (DOI) for management as part of the Alaska Maritime National Wildlife Refuge.

The 22 remaining AOC sites, known as the OU B-2 sites, are the subject of this Remedial Investigation/Feasibility Study (RI/FS) Report. These sites are within the boundary of Parcel 4. Parcel 4, which is 5,624 acres in size, is currently retained by the Navy. Parcel 4 is expected to be transferred to DOI as part of the Alaska Maritime National Wildlife Refuge following completion of remedial actions. The purpose of the RI/FS is to collect and analyze data at sites potentially contaminated with ordnance and explosives/unexploded ordnance (OE/UXO) at the 22 OU B-2 sites. The 22 OU B-2 sites and the remedial action recommendations are as follows:

- Andrew Lake Disposal Area (ALDA-01) – detector-aided visual surface clearance 6.7 acres
- Andrew Lake Beach Crater Area (ALDA-02) – Adak no further action (NOFA) 9.5

EXECUTIVE SUMMARY (continued)

- Andrew Lake Seawall Area (ALSW-01) – periodic beach sweeps by Navy explosive ordnance disposal (EOD) personnel — 10.0
- Andrew Lake Hand Grenade Range (HG-01) – detector-aided visual surface clearance — 2.0
- Andrew Lake World War II Magazine (MAG-01) – detector-aided visual surface clearance — 12.3
- Andrew Lake Rocket Disposal Site (MI-01) – detector-aided visual surface clearance — 0.7
- Andrew Lake 40mm Impact Area (MI-02) – detector-aided visual surface clearance — 19.0
- Andrew Lake Mortar Impact Area (MI-03) – detector-aided visual surface clearance — 425.0
- Andrew Lake Disposal Range (OB/OD-01) – detector-aided visual surface clearance — 18.0
- Andrew Lake 40mm Rifle Grenade Range (RG-01) – prescribed burn and clearance — 16.0
- Andrew Lake Hand Grenade/40mm Area (RR-01) – detector-aided visual surface clearance — 182.0
- Andrew Lake Mortar Impact Area (RR-02) – detector-aided visual surface clearance — 231.0
- Andrew Lake Flare Disposal Site (RR-03) – Adak NOFA — 0.2
- Andrew Lake Subcaliber Training Range (SA-01) – detector-aided visual surface clearance — 10.2
- Blind Cove Impact Area Firing Point #1 (BC-03) – Adak NOFA — 0.2
- Combat Range 1 Mortar Impact Area (C1-01) – detector-aided visual surface clearance — 387.0
- Jesse Morgan Candidate Chemical Weapons Disposal Site (JM-01) – Adak NOFA — N/A
- Mount Moffett Impact Area Lone 81mm Mortar (MM-10D) – Adak NOFA — 0.2
- Source Area 93 Multiple Impact Area (SA93-01) – detector-aided visual surface clearance — 263.0
- Source Area 93 Eastern Impact Area (SA93-02) – detector-aided visual surface clearance — 78.0
- Source Area 93 Firing Point (SA93-03) – detector-aided visual surface clearance — 0.6
- Source Area 93 Eastern Disposal Site (SA93-04) – detector-aided visual surface clearance — 0.25

TOTAL — 1671.85

22 AOCs

Minus NOFAs — 1661.75

EXECUTIVE SUMMARY (continued)

The data collected during extensive investigations were used to provide input to the hazard assessment methodology. The evaluations in this RI/FS are based on data collected during the 1999 Site Inspection and the 2000 RI/FS. The data were evaluated during the preparation of this report, and 17 AOCs were identified for FS evaluation. Five AOCs are recommended for NOFA status.

The results of the FS evaluation shows that Alternative 2 (detector-aided visual surface clearance) was the "best" alternative for 15 of the 17 AOCs. Alternative 2 was determined to be technically impracticable for one AOC: Andrew Lake Seawall (ALSW-01). The basis for this determination is the continued wash-up of ordnance items on the Andrew Lake Seawall from offshore source(s) on the seaward side of the wall. It is not possible with existing technology to reliably remove ordnance from the offshore source areas to eliminate wash-up of these ordnance items to the seawall area. For the Andrew Lake 40mm Rifle Grenade Range (RG-01), a site-specific alternative was developed involving a prescribed burn to remove vegetation and clearance using hand-held magnetometers and/or gradiometers. The basis for the recommendation of this alternative is the sensitive nature of the fusing mechanism for the suspected ordnance (40mm grenades). The potential explosive safety hazard presented by this munition requires use of a more meticulous clearance approach.

Because remediation of the Andrew Lake Seawall Area (ALSW-01) is currently deemed technically impracticable, this area cannot be transferred to DOI for management as part of the Alaska Maritime National Wildlife Refuge until such time that a technically practicable means of completing the remediation is identified. The DOI has stated that until all OU B-2 sites within the boundaries of Parcel 4 have been remediated to allow use as a wildlife refuge, DOI will not accept transfer of any of the Parcel 4 real estate. In view of the stated position of DOI relative to the transfer of Parcel 4, the Navy intends to manage all Parcel 4 areas as an "Access Restricted Navy Exclusion Area" until such time as it is possible to transfer Parcel 4 in its entirety to DOI for management as part of the Alaska Maritime National Wildlife Refuge. Therefore, while the reasonably expected long-term future land use for OU B-2/Parcel 4 is wildlife refuge, the current and expected near-term land use will be "Access Restricted Navy Exclusion Area." Institutional and engineering controls to limit public access to the exclusion area (OU B-2 Parcel 4) will be maintained until a transfer is possible. Remediated OU B-2 sites within the boundaries of Parcel 4 will also be

EXECUTIVE SUMMARY (continued)

maintained as part of this exclusion area until such time as it is possible to transfer these sites to the U.S. Fish and Wildlife Service for inclusion in the wildlife refuge. ALSW-01 will require periodic beach sweeps by Navy EOD until a technically practical site-specific alternative has been developed to deal with the effects of continued onshore transport of ordnance from an offshore source or sources.

1. INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of the Remedial Investigation/Feasibility Study (RI/FS) was to collect and analyze data at sites potentially contaminated with ordnance and explosives (OE) and unexploded ordnance (UXO) at 22 Operable Unit (OU) B-2 sites at the former Naval Air Facility (NAF) on Adak, Alaska. Data used to develop the OU B-2 RI/FS were collected in 1999 and 2000. The relevant OU B-2 sites are as follows:

- Andrew Lake Disposal Area (ALDA-01)
- Andrew Lake Beach Crater Area (ALDA-02)
- Andrew Lake Seawall Area (ALSW-01)
- Andrew Lake Hand Grenade Range (HG-01)
- Andrew Lake World War II Magazine (MAG-01)
- Andrew Lake Rocket Disposal Site (MI-01)
- Andrew Lake 40mm Impact Area (MI-02)
- Andrew Lake Mortar Impact Area (MI-03)
- Andrew Lake Disposal Range (OB/OD-01)
- Andrew Lake 40mm Rifle Grenade Range (RG-01)
- Andrew Lake Hand Grenade/40mm Area (RR-01)
- Andrew Lake Mortar Impact Area (RR-02)
- Andrew Lake Flare Disposal Site (RR-03)
- Andrew Lake Subcaliber Training Range (SA-01)
- Blind Cove Impact Area Firing Point #1 (BC-03)
- Combat Range 1 Mortar Impact Area (C1-01)
- Jesse Morgan Candidate Chemical Weapons Disposal Site (JM-01)
- Mount Moffett Impact Area Lone 81mm Mortar (MM-10D)
- Source Area 93 Multiple Impact Area (SA93-01)
- Source Area 93 Eastern Impact Area (SA93-02)

- Source Area 93 Firing Point (SA93-03)
- Source Area 93 Eastern Disposal Site (SA93-04)

The data collected during this and previous investigations are used to provide input to an Adak-specific hazard assessment tool that analyzes the results of the RI and determines the potential magnitude of the risk/hazard present. The data have been evaluated during the preparation of this report and, through the feasibility study, areas have been selected for remedial action.

RI/FS data collection began during the 1999 field season; however, due to the large volume of work scoped for the RI, it was not possible to complete the investigation in a single field season. The ultimate goal of the U.S. Navy (Navy) is to relinquish the Public Land Order (PLO). The northern portion of Adak Island was withdrawn by PLO 1949 for use by the Navy for military purposes and the Navy established Naval Air Station Adak, which was subsequently designated Naval Air Facility Adak. NAF Adak and the surrounding lands as defined in PLO 1949 is referred to as the Adak Naval Complex (TAC 2000). The Navy intends to relinquish the PLO and its primary jurisdiction of the military reservation property as a whole as soon as all remedial actions necessary to allow use of the property as a wildlife refuge without restriction have been completed. Until these remedial actions are completed, the Navy intends to maintain the area as an "Access Restriction Navy Exclusion" area.

This project is being conducted to meet Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 120; CERCLA 120(h); and Department of Defense (DoD) 6055.9-STD site characterization requirements for federal land transfer. All actions required under CERCLA must be completed prior to assertion that the CERCLA 120(h) covenant requirements are met and the real estate can be transferred.

1.2 PROJECT BACKGROUND

Adak is divided into two OUs: OU A and OU B. OU A was created first, to address chemical contaminant issues. In January 1999, the Federal Facilities Agreement (FFA) was amended to create OU B to address ordnance contamination issues. OU B was, in turn, divided into OU B-1 and OU B-2 to facilitate completion of investigation/remedial action and transfer of sites subject to the September 2000 land transfer agreement (LTA) between the Navy, U.S. Department of the Interior, and The Aleut Corporation (TAC). Under the terms of this agreement, approximately 47,000 acres of real estate within the military reservation on the northern portion of Adak Island were to be transferred to TAC

(Figures 1-1 and 1-2). The land exchange conveying approximately 47,000 acres of the former NAF Adak property to TAC was finalized in March 2004. OU B-1 includes 163 sites and encompasses approximately 70,500 acres of the former military reservation on the north half of the island. OU B-2 includes 22 original sites on approximately 5,600 acres and also encompasses 4 OU B-1 sites.

The Navy is the lead agency responsible for the Adak cleanup effort. The U.S. Environmental Protection Agency (EPA) Region 10 and Alaska Department of Environmental Conservation (ADEC) provide regulatory agency oversight for the project. The interests of a variety of stakeholder organizations in the project are addressed through participation in the OU B Project Team. This team is made up of representatives from the Navy, ADEC, EPA, and U.S. Fish and Wildlife Service (USFWS), stakeholders such as the Aleutian/Pribilof Islands Association (A/PIA), TAC, and community representatives and consultants for the various members. The Project Team was formed in July 1999 to facilitate the development of a site-specific CERCLA process for development of the remedial investigation planning for OU B on Adak Island.

A framework for the 2000 RI/FS field season was developed by the OU B Project Team through a series of meetings, telephone conferences, and electronic correspondence. This framework includes the specific methodology for geophysical survey of the Areas of Concern (AOCs), a Preliminary Assessment Screening Tool (Level 1 Screen), and Explosives Safety Hazard Assessment (ESHA) methodology. The ESHA methodology is an Adak-specific hazard assessment tool that analyzes the results of data collection, determines the potential magnitude of the risk/hazard present, and determines the need for further investigation or remediation of sites.

A Record of Decision (ROD) for OU B-1 sites was produced and signed in December 2001 (Navy 2001). The ROD details the remedial alternatives considered for the 27 OU B-1 sites and documents the selected alternatives. An observational approach combining investigation and clearance to 4 feet below ground surface was chosen as the remedy for the OU B-1 sites. Subsequent agreement by the OU B Project Team has resulted in a preliminary decision that the observational approach for remediation agreed to for OU B-1 sites will be adopted as the presumptive remedy for OU B-2 sites forwarded to the FS.

This RI/FS Report details the investigation data that have been generated to date for the OU B-2 sites. The OU B Project Team has agreed to use data gathered at OU B-2 sites collected

during and prior to the 1999 Site Investigation (SI), as well as evaluations during the 2000 RI/FS to develop the RI/FS evaluations for sites addressed in this report.

1.3 REPORT ORGANIZATION

This Draft RI/FS Report includes a number of components that have been developed to guide the performance of the RI and subsequent FS for the OU B-2 sites.

The main body of the report contains all of the general information relating to the RI/FS, including the following:

- A summary of pre-RI/FS ordnance investigations (Section 2)
- A Conceptual Site Model (CSM) (Section 2)
- A summary of the Preliminary Site Assessment screening conducted to identify sites for RI/FS (Section 2)
- A detailed description of the physical setting and resources on Adak (Sections 2.1 and 5)
- A description of the regulatory history of the island and the current status of activities initiated in response to regulatory actions (Section 3)
- A description of the community relations program in place on Adak (Section 4)
- A detailed site history (Section 5)
- A discussion of the RI/FS methodology; search and characterization techniques for various types of historical ordnance use areas such as impact areas and munitions storage areas; and the data quality objectives (DQOs) for this work (Section 6)
- Hazard Assessment Methodology and ESHA Analysis Criteria (Section 7)
- A description of the FS methodology (Section 8)
- Screening Analysis and Analysis of Remedial Alternatives and evaluation of nine CERCLA criterion (Section 8)
- References (Section 9)

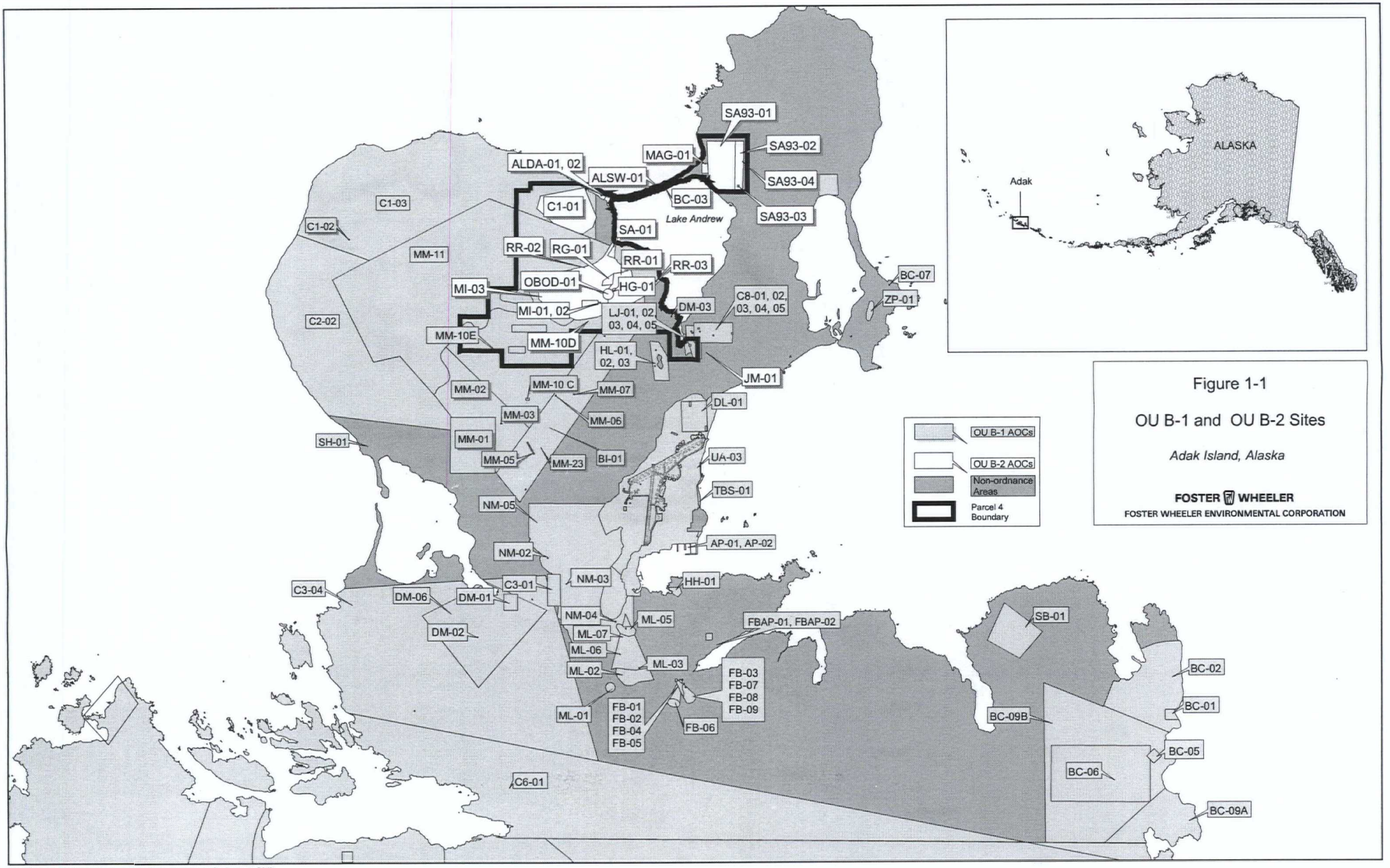


Figure 1-1

OU B-1 and OU B-2 Sites

Adak Island, Alaska

FOSTER WHEELER

FOSTER WHEELER ENVIRONMENTAL CORPORATION

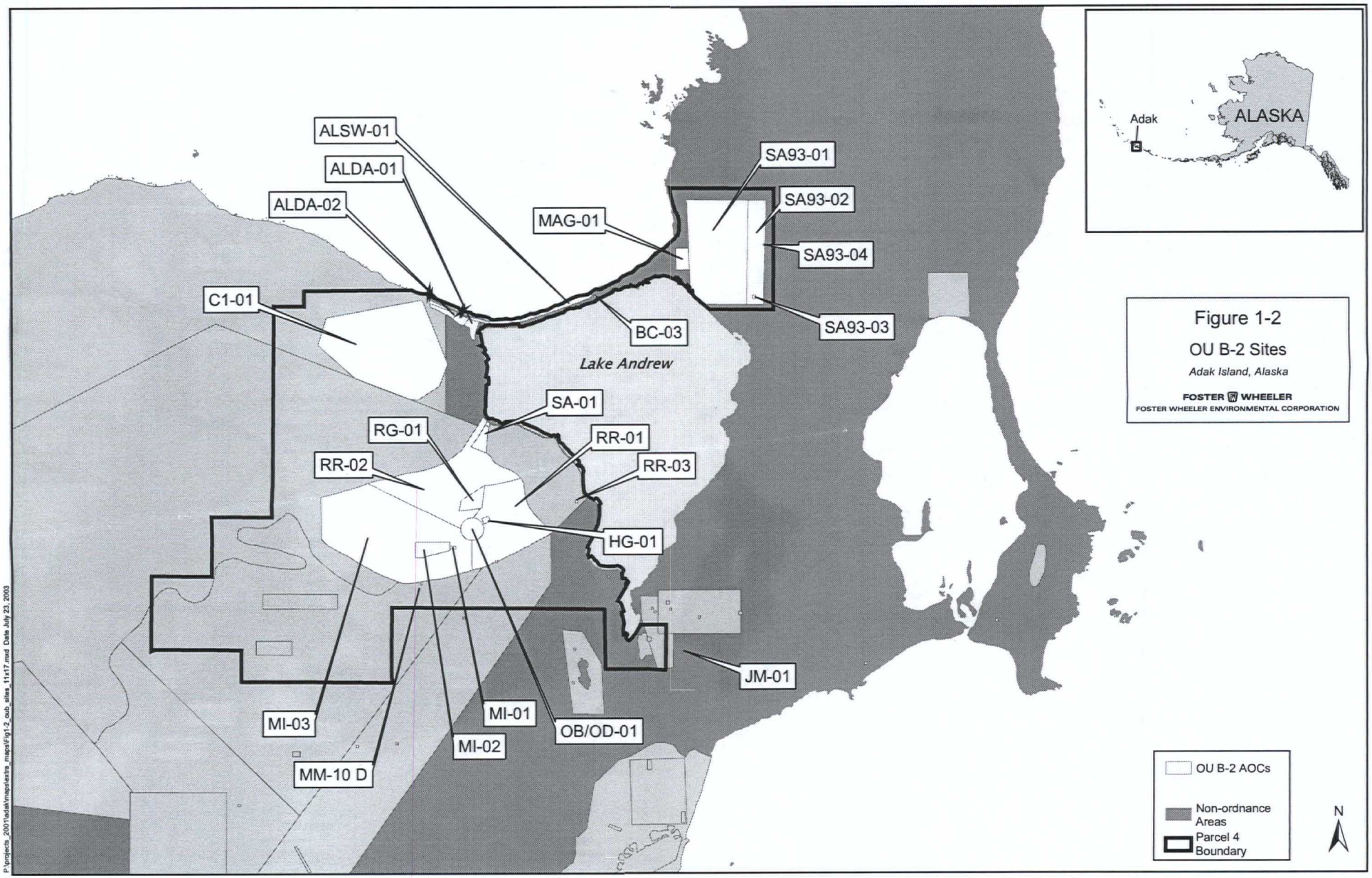

ALSW-01
ALDA-01
ALDA-02
MAG-01
SA93-01
SA93-02
SA93-04
SA93-03
C1-01
BC-03
Lake Andrew
SA-01
RG-01
RR-01
RR-02
RR-03
HG-01
JM-01
MI-03
MI-01
MI-02
OB/OD-01
MM-10 D
Adak
ALASKA
Figure 1-2
OU B-2 Sites
Adak Island, Alaska
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION
OU B-2 AOCs
Non-ordnance Areas
Parcel 4 Boundary
N
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Table 2-1. 1999 UXO Survey Ordnance-related Target Anomaly Item Summary

Sector	Target Anomalies Detected	Anomalies Investigated	Ordnance-Related Items[1/]	UXO	Abandoned OE	OE Scrap	Inert Ordnance
Andrew Lake Disposal Site	65	39	27		3	24	
Blind Cove/Campers Cove Impact Area	25	25	1			1	
Clam Lagoon Bomb Storage Area	231	173	9			9	
Combat Range 1	125	113	48	3		45	
Combat Range 2	140	140	2			2	
Combat Range 3	70	70	12	3	3	6	
Combat Range 6	182	138	4			3	1
Combat Range 8	464	324	7		5	2	
Finger Bay Ammunition Complex	131	124					
Finger Bay Impact Area	209	171	13		2	11	
Gun Emplacements							
Andrew Lake Gun Emplacement	4	4					
West of Runway Gun Emplacement	1	1					
Zeto Point Gun Emplacement	30	30	1			1	
Hammerhead Cove Impact Area	156	107	1			1	
Hand Grenade Range	180	155	27	2	1	24	
Haven Lake Ordnance Area	891	440	3		2	1	
Lake De Marie Impact Area	57	57	17			17	
Lake Jean Ammunition Complex	265	227	8	1	3	3	1
Mitt Lake Impact Area	186	109	12	4	2	6	
Mortar Impact Area	522	303	181	16	5	160	
Mount Moffett Impact Area	538	423	133	4	1	128	
NAF Adak/Lake De Marie Magazine	284	225	5	2	2	1	
Open Burn/Open Detonation (OB/OD) Disposal Range	892	341	104	1	11	92	
Range Remainder	222	198	52	3	2	47	
SA93 World War II Mortar Impact Area	342	313	129	26		103	
Scabbard Bay Impact Area	20	15	1			1	
Small Arms Ranges	563	359	106	1	6	99	
Zeto Point Impact Area	445	367	3			3	
Totals	**7,240**	**4,991**	**906**	**66**	**48**	**790**	**2**

Notes: [1/]Includes total of UXO, abandoned OE, OE scrap, and inert ordnance. Areas that include OU B-2 sites are highlighted in grey.

The differences between the values in columns two and three of this table are due to the presence of non-ordnance-related metallic items such as nails, cans, etc., or false positive target identification stemming from conservative interpretation of raw geographical data.